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Abstract

EVOLUTION OF THE URANIUM INDUSTRY IN FRANCE

(Commissariat à l'Energie Atomique, France)

The main feature in the development of the French uranium industry during the last few years is the completion of the programme, abready started in 1958, for the equipment of mining units and treatment plants.

It was thus possible by 1961, to reach a production capacity of about 2000 T of metal contained in concentrates, and about 1800 T of metal of nuclear purity.

The prospection and research carried on in France by the Commissariat and by private Industry have brought about not only a satisfactory renewal of the reserves under exploitation but also the development of two new uranium-producing regions : one of the usual type in France, in the crystalline formations to the South-East of the Massif Central, the other in the Permian sedimentary formations in the department of l'Hérault.

Ore extraction is essentially taken care of by the Commissariat à l'Energie Atomique in the three mining districts Vendée, Limousin and Forez, private industry having been unable to form any large production unit under the conditions prevailing in recent years.

Physical methods of concentration have been gradually abandoned, with the exception of a continuous radiometric sorting at the Bessines plant and the gravimetric concentration of uranothorianite ores at Madagascar.

[1] Translation provided by courtesy of the submitting Government

Uraniferous concentrates are produced in two forms :

-on the one hand two chemical plants run by a combined Commissariat-private industry firm, the Société Industrielle des Minerais de l'Ouest, produce magnesium uranates by a conventional process, in the Vendée and at la Crouzille ;

- on the other hand two Commissariat plants, one managed by the same Society in the Forez, the other run directly by the Commissariat at Gueugnon in the Grury mining district, at present inactive, produce uranyl nitrate : the former from ore extracted in the Forez region, the latter from magnesium uranate preconcentrates imported from Gabon.

Two Commissariat plants convert the concentrates into a product of nuclear purity :

- one at le Bouchet, run by the C. E. A., which also deals with development studies,

- the other at Malvesi, managed by a Commissariat-private industry combine, the Société de Raffinage de l'Uranium.

This latter has a production capacity about double that of le Bouchet and uses the same manufacturing processes.

The bulk of the uranium metal is still produced by calcium reduction, but the le Bouchet plant is already equiped for magnesium reduction and is using this process.

Uranium fluoride is obtained by a technique peculiar to the French process, in combined vertical furnaces giving a direct transformation of trioxide (UO_3) to fluoride with a very low oxygen content ; particularly advantageous production yields can thus be obtained. The equipment of the Malvesi plant will be modernised in the near future to make use of this process.

The plant at le Bouchet also contains equipment for the treatment of uranothorianite concentrates imported from Madagascar. The original process, based on solvent purification and oxalic separation, has been replaced by a more modern method using selective dissolution, which enables pure nitrates to be produced under excellent conditions.